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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/540,910

03/03/2006

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033794/294139

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11/25/2008

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EXAMINER

RO, BENTSU

ART UNIT

PAPER NUMBER

2837

MAIL DATE

DELIVERY MODE

11/25/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/540,910	<b>Applicant(s)</b> DAINEZ ET AL.	
	<b>Examiner</b> BENTSU RO	<b>Art Unit</b> 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 21 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-20 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6-24-2005</u> .   | 6) <input type="checkbox"/> Other: _____                          |



**FIRST OFFICE ACTION ----- AN EX PARTE QUAYLE ACTION**

1. Claim 21 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 21 has not been further treated on the merits.

Claim 21 would be allowable if claim 21, line 2 is amended to read as --as defined in anyone of claims 18 to 20.--.

2. Claim 4 should be amended. Claim 4, line 2, change the recitation "the electronic de switching device (52)" to -- the electronic switching device (52)--.

3. Drawing corrections are required as follows:

- In Fig. 1, there are two reference numerals "1" representing the piston. One on the left-hand side with a leading line pointing toward the piston of the linear compressor 10. This one is OKed. The other one is on the right-hand side with an arrow straight line pointing toward the support 4. This line should be deleted because the indicated element is not a piston.
- In Fig. 8, inside the control block 50, there is a block "51" labeled as "Compressor". This label is incorrect. This label should be changed to "Microprocessor" or "Electronic Circuit", see the specification page 11, line 26.

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- In Fig. 8, inside the cooling block 56, there is a cooling system 57. This cooling system 57 has been erroneously labeled as "Cooling sensor". Thus, the "Cooling sensor" block 57 should be changed to "Cooling System" block 57.

4. Claims 1-20 are allowable.

5. The following is a statement of reasons for the indication of allowable subject matter: The invention is to correct the applied voltage to the compressor motor based on the piston's displacement at the resonant frequency. A changing in the resonant frequency changes the piston's displacement, and thus, the applied voltage to the compressor motor should also be changed. The independent claims 1, 13 and 18 do incorporate this type of correction. For example, independent claim 1 recites

- measure the actuation phase of the circulating current in the motor;
- measure the dynamic phase of the piston;
- establish a relationship between the actuation phase and the dynamic phase;
- determine a measured phase;
- and control the applied voltage to the motor.

No prior art teaches such a feature. The best reference found is USPN 6,851,934 (Yoo et al). This reference Fig. 2 teaches a stroke detecting unit 120 for detecting the displacement of the piston; a current detecting unit 110 for detecting the

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current phase; a phase difference detecting unit 130 for detecting a phase difference between the piston displacement and the current phase. For claim 1, this reference does not teach:

- the electronic circuit (51) obtains a value of a correction voltage (VF) from the value of the measured phase,
- the electronic circuit (51) obtains a value of a defined voltage (Vp) from a physical position (DP) of the movable assembly (1),
- the electronic circuit (51) actuates on the value of the application voltage (VT) from the sum of the correction voltage (VF) and the defined voltage (Vp).

For claim 13, this reference does not teach:

- establishing a relationship between the measured phase (~PC) and a physical position (DP) of the movable assembly (1), determining a preferable position. (DEPMAX) of the movable assembly (1);
- establishing a relationship between the measured phase (~ec) and the preferable position (DPMAX), obtaining an application voltage (VT) to be applied to the motor (1').

For claim 18, this reference does not teach:

- the control circuit (51) measures an actuation phase of the circulating current in the motor (1') and a dynamic phase of the movable assembly (1) and establishes a relationship between the actuation phase and the dynamic phase, determining a measured phase, the control circuit (51) alters the value of the application voltage (VT) applied to the motor (1') in a way proportional to the value of the measured phase.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication should be directed to BENTSU RO at telephone number (571)272-2072.

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/BENTSU RO/  
Primary Examiner, Art Unit 2837